e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2022; 14(9); 871-875

Original Research Article

Incidence of Non Hodgkin Lymphoma and its Cytohistopathological Correlation at Tertiary Care Centre

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Received: 24-07-2022 / Revised: 23-08-2022 / Accepted: 20-09-2022
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Conflict of interest: Nil

Abstract

Background: Excision biopsy is frequently advised for lymphadenopathy, a relatively common disorder, when fine needle aspiration cytology is inconclusive. Non-Hodgkin lymphoma is a global epidemic with regional, racial, and geographic variations. With the exception of prostate cancer, melanoma, and lung cancer in women, Non Hodgkin lymphoma incidence has increased more quickly than all other cancers combined. The purpose of this study is to determine the prevalence of NHL at PMCH and its subtypes in various age groups with distinctions based on gender, cytohistopathological correlation, and occasionally immunohistochemistry correlation.

Materials and Methods: The current study entails FNAC, histopathologic analysis of lymph node masses prospectively from September 2020 to August 2021, immunohistochemistry correlation in some cases depending on the availability of monoclonal antibodies, and immunohistochemical correlation in other situations. Giemsa and PAP would be used to stain FNA for cytology, and formalin-fixed, wax-embedded, H & E sides would be prepared for histopathology. In some circumstances, preparation and staining of slides for IHC would be done in accordance with procedure.

Results: Out of the entire 92 cases, 22 (23.9%) had both metastatic lesions and TB, and 40 (43.4%) had chronic non-specific lymphadenitis. The overall sensitivity of lymph node imprint cytology was 96.73% for tuberculosis, 96.74% for chronic non-specific lymphadenitis, 96.74% for lymphoma, and 100% for metastatic lesions, respectively.

Conclusions: Compared to histological and fine needle aspiration cytology, immunohistochemistry and the histopathological report correlate substantially better.

Keywords: Immunohistochemistry, Lymph node, H & E sides.

Introduction

Fine Needle Biopsy has been practiced in Europe for many years, particularly by haematologist in conjunction with aspiration of bone marrow and spleen. It took longer for method to become widely accepted in the Anglo American world. Martin and Ellis of the pear Memorial hospital were pioneers

in this field and there work was later followed up by Betsil and Hajdu.

The role of cytology in diagnosis of lymphoma has become more clearly defined in recent years. The accuracy of cytomorphology alone in the diagnosis and typing of malignant lymphoma is limited and routine cytological preparation needed to be supplemented with flowcytometry or with panel of immunemarkers using multiple smears, cytocentrifuse preparation or cell blocks of lymphnode aspirates or core needle biopsy specimen.

Conflicting opinions are expressed in the literature regarding the accuracy of cytological diagnosis and typing of malignant lymphoma. Accuracy of diagnosing No Hodgkin lymphoma by cytomorphology alone is in the range 60-80% significantly lower for low grade than for high grade lymphoma.

Diagnostic sensitivity has generally been found to be lower for lymphoma than for metastatic malignancy. In a recent extensive review of literature 2/3 of 30 studies review in which fine needle biopsy was supplemented by immunophenotyping, diagnostic sensitivity was over 80% and specificity over 90%.

The wide variation in the reported accuracy of diagnosis and typing of Non Hodgkin lymphoma probably reflect the environment in which the studies were carried out. A high accuracy have been achieved in a few highly specialized centers equipped with full armamentarium and expertise related to ancillary laboratories. Most hospitals have more limited resources and most worker consider histology is still necessary in primary diagnosis of lymphoma – 'no meat no treat' to be able to determine any altered tissue and immunoarchitexture and also the cellular composition of tissue section which is not per se reflected in the aspirated cell sample.

The most recently proposed WHO classification with assistance of immune marker has improved the correlation due to diminished importance of tissue architexture in the evaluation of Non Hodgkin lymphoma. However, the accuracy of cytologic diagnosis is still limited in some form of Non Hodgkin lymphoma, notably lymphomas with predominantly small cells, mainly marginal zone lymphoma and in peripheral T cell lymphoma and T cell rich B cell lymphoma. This is also the case with the diagnosis of composite lymphoma and in the grading of follicular lymphoma.

Material and Methods

This study was a prospective cross-sectional study conducted in a hospital setting at the Patna Medical College in Patna, Bihar, from September 2020 to August 2021. Fresh samples of the excision of all lymph nodes were given in normal saline. To avoid any formalin-induced cytological artefacts, the cytology process was carried out on the same day. Gross observations were made, including the size, colour, and evidence of necrosis. The specimens were divided into two parts.

The sliced half was gently held in one hand or with forceps with the flat cut surface facing upward. On glass slides free of grease, four impression smears were created. Following this, lymph nodes were formalin-fixed and then processed for histological analysis in accordance with the normal protocol. According to the suggested method, MGG and PAP stains were applied to both air dried and wet fixed smears. When necessary, specialised stain was used.

The pathologists examined the smears and determined a diagnosis based on the cellularity, distribution, and cell types. In every instance, an effort was made to separate the lesions into inflammatory, primary, and metastatic tumours.

Inflammatory cases include tuberculosis, chronic nonspecific diseases, and acute nonspecific cases. Primary malignancies include Hodgkin lymphomas and Non-Hodgkin lymphomas. More work was put into classifying the many types of metastatic malignancies.

All data were entered into the SPSS 17 programme. The gold standard was a histopathological report. Cytological results and histological conclusions were connected. The following formulas were used to increase the lymph node imprint cytology's diagnostic accuracy:

Sensitivity= TP/TP+FN x100
TP= True positive

Specificity=TN/TN+FP x100
TN= True negative

Positive predictive value (PPV) =TP/TP+FP x100 FP= False positive

Negative predictive value (NPV) =TN/TN+FN x100 FN= False negative

Accuracy= TP+TN/Total number of cases x100

Results

In partnership with the department of surgery, the pathology department examined 92 cases of lymph node specimens. In our study, the male to female ratio was 1.2:1. The majority of incidents affected people between the ages of 10 and 19. The most frequent condition in our study was an inflammatory lesion, which included tubercular lymphadenitis in 23.92% of cases and chronic non-specific lymphadenitis in 43.48% of cases.

Squamous cell carcinoma made up 14.2% of the instances of metastatic tumour, and adenocarcinoma made up 5.4%. 7.6% of the cases were primary malignancies, which included both Hodgkin and Non-Hodgkin lymphomas. (Table 1)

Table 1: Incidence of various causes of lymphadenopathy (n=92)

Diagnosis	Total	Percentage (%)
Inflammatory Lesions	**63**	**68.48%**
• Tuberculosis	22	23.92%
• Chronic Non Specific	40	43.48%
• Acute Non Specific	01	1.08%
Primary Tumors	**07**	**7.60%**
• Hodgkin Lymphoma	02	2.17%
• Non-Hodgkin Lymphoma	05	5.43%
Secondary Tumors	**22**	**23.91%**
• Squamous Cell Carcinoma	14	15.22%
• Adenocarcinoma	05	5.43%
• Other	03	3.26%
Total	**92**	**100%**

When cytology was compared to histology, its sensitivity, specificity, and overall accuracy were reported to be 90.90%, 98.57%, and 96.73%, respectively, in tuberculous lymphadenitis. (Table 2) Histopathology revealed that one case of TB was actually Non Hodgkin Lymphoma. Sensitivity was 100%, specificity was 94.23%, and total accuracy was 96.75% in the case of chronic nonspecific lymphadenitis. From a total of 43 cases of chronic non-specific lymphadenitis, the

histology revealed two cases of TB and one case of non-Hodgkin lymphoma. Cytology was inconclusive in one instance. Histopathology determined that it was lymphoma with a sensitivity of 57.14%. Cytology has a 100% sensitivity and specificity rate, properly identifying every case of metastatic malignancy. (Table 2).

Table 2: Sensitivity, specificity and accuracy of imprint smear diagnosis in various diseases

Smear Diagnosis	No. of cases	Tuberculosis	Chronic Non-Specific	Acute Non-specific	Lymphomas	Metastasis	Sensitivity (%)	Specificity (%)	Accuracy (%)
Tuberculosis	21	20			01		90.90	98.57	96.73
Chronic Non-Specific	43	02	40		01		100.00	94.23	96.74
Acute Non-Specific	01			01					
Lymphoma	04				04		57.14	100.00	96.74
Metastasis	22					22	100.00	100.00	100.00
Inconclusive	01				01				
Total		22	40	01	07	22			

Discussion

Lymph node enlargement is a very frequent clinical symptom. Primary and secondary cancers as well as a number of inflammatory disorders can be the culprits. The first technique carried out is typically a fine needle aspiration cytology, which can reliably diagnose most instances. However, a number of authors [1-4], have observed that FNAC has a probability of failing. Deeper lymph nodes and an unskilled hand are frequent reasons for failure. Additionally, FNAC alone cannot diagnose all cases, particularly those involving lymphomas. In all such circumstances, a biopsy is frequently performed. Imprint cytology of lymph nodes is a reasonably priced diagnostic technique that enables prompt diagnosis without requiring the patient to wait for the histopathology report, which typically takes 5-7 days. This study was conducted to assess how lymph node cytology interacts with histopathology. In our analysis, inflammatory lesions made up 68.48% of the cases. Similar results were reported in other investigations [5]. In agreement with Arif *et al*.[6], our study's results for lymph node imprint cytology's sensitivity, specificity, and overall accuracy for tuberculosis were 90.90%, 98.57%, and 96.73%. According to histology, one case of tuberculosis identified through cytology was actually lymphoma. Similar cases of plasmacytoma being misdiagnosed as tuberculosis have been described by Sharma N *et al*.[7] When making a cytological diagnosis, the sporadic granuloma and occasionally even necrosis in lymphoma might lead to confusion between tuberculosis and high grade lymphoma. In this investigation, two cases of tuberculosis were misdiagnosed as reactive lymphadenitis. This could be due to variation in cellular yield on smears. Similar to lymph node imprint cytology, Kundu *et al*. and Al Muhim *et al*. found that it had a very good sensitivity, specificity, and accuracy for lymphoma [5,8]. Feinberg M. *et al*., on the other hand, discovered a

sensitivity of only 83% for Non Hodgkin Lymphoma and 66% for Hodgkin Lymphoma [9]. These differences might be the result of our study's short sample size. Furthermore, the cytomorphological picture on a cytological smear is incomplete, making lymphoma identification difficult both on cytology and FNAC. In our investigation, lymph node cytology had 100% accuracy, sensitivity, and sensitivity for metastatic lesions. No instance of a false positive or false negative occurred. Arif S *et al*. and Bhabra K *et al*. reported similar results [6,10]. In our study, lymph node cytology had an overall accuracy of 94.2% in the identification of different lymph node illnesses, which is comparable to other studies [8-12].

Conclusions

These data incidence are consistent with recent data for India and marginally higher than global data. According to published research, the association between immunohistochemistry and a histological report is substantially better than it is for cytology and histopathology. Non Hodgkin Lymphoma types and distribution presented in the study are most likely are reflection of the incidence rate in the study population.

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